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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/592,024

09/07/2006

Gert Nilsson

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EXAMINER

BRUTUS, JOEL F

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/592,024	Applicant(s) NILSSON ET AL.	
	Examiner JOEL F. BRUTUS	Art Unit 3768	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-22 and 36-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-22 and 36-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih (US Pat: 6,061,176) in view of Godik (US Pat: 5,699,797) and further in view of Nilsson (US Pat: 5,361,769) and Zinser et al (US Pat: 5,620,000).

Regarding claim 12, Shi discloses a microscope that determines microcirculation of blood in human body and may also observe the microcirculation of blood of other animals [see column 4 lines 35-40].

Shih discloses the microscope includes white light source such as flash light 18, dual-optical-circuit monochromatic light sources 17, a high color temperature bromine-tungsten lamp 171, a high-pressure mercury-vapor lamp 172, a scan, track and auto digits display system 10, a detector 110, a pick-up tube 112, an optical index plate 113, and two spectral prism [see column 3 lines 47-59].

Shih discloses images showing the circulation of blood in arterioles of human blood circulation system are obtained via a microscope 1. After conversion by an analog-to-digital converter in the mainframe 2 and stacking of the images with digits in

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an image card 6 by the microcomputer 4, the images of circulation are directly displayed on the monitor 5 to enable measuring of microcirculation. Shih discloses light beams from light source are guided into the region of interest [see column 2 lines 1-10].

With regards to photosensitive array; Applicant discloses a photosensitive array may be a digital camera. Alternatively, conventional types of sensors producing analog signals are conceivable and may be connected to an analog/digital converter of conventional nature [see 0010, specification].

Although Shih doesn't disclose a photodetector array, however, Shih discloses a detector 110 [see fig 1] that detects backscattered lights [see fig 1]. However, Shih discloses a camera 19 that can be switched to the optical circuit [see column 3 lines 47-59 and fig 1] that is capable of detecting polarized reflected light as disclosed by Applicant. Therefore, camera 19 is relied on as the photosensitive array (emphasis added).

Shih doesn't specifically mention data matrixes representing red, blue and green and displaying or presenting microcirculation in red, green and blue; and polarizer filter.

However, Shih discloses stacked signals to digital graph signals and images of microcirculation with stacked graphs are displayed on the monitor 5 [see column 5 lines 5-12 and abstract]] which means the computer has the capability of separating signals data into matrixes (emphasis added).

Nonetheless, Zinger et al further teach polarizing filter [see column 12 lines 15-19] that is capable of illuminating a tissue surface with polarized light (emphasis added). Zinser et al further teach computer 32 collects a matrix $M \times N$ measured values [see

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column 5 lines 59-62] and a second matrix MxN of measured values which are subject to FFT Fourier transform [see column 8 lines 52-57]. Zinser et al also disclose matrices can be displayed on the screen of computer 32 as an image which represents the flow rate [see column 7 lines 10-17].

Further, Nilsson discloses a photodetector 9 detecting backscattered lights from body part into a signal processing 10 to convert the detected light to digital values [see column 4 lines 48-60] and further disclose deliver measurement values to computer 7 to determine blood circulation [see column 4 lines 48-60]. Nilsson discloses a color monitor connected to computer 7 to display microcirculation in specific colors [see column 5 lines 1-8] which could be red, green and blue (emphasis added).

In addition, Godik discloses display microcirculation behaviors of physiological liquids are marked with the help of pseudo-colors [see column 12 lines 11-18] which could be red, green and blue (emphasis added).

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Shih with Godik and Nilsson by using pseudo-colors and specific colors, which could be red, blue and green to display microcirculation; in order to increase visualization and because it's helpful in early diagnosis, medication instruction, and emergent treatment of cardiovascular diseases, cerebral apoplexy, necrosis of distal end of limbs caused by diabetes and angiitis see column 3 lines 34-45, Shih].

One skilled in the art at the time the invention was made would have been motivated to combine Shih with Zinger et al by using polarizer filter and computer 32

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that separates data into MxN matrices and can display matrices as disclosed above along with color specific teachings of Godik and Nilsson that could be red, green and blue; and implement these matrices with red, blue and green; in or to accurately and precisely representing microcirculation with an increased visualization.

Regarding claims 14-15, Shih doesn't disclose polarizing filter provides a polarization direction orthogonal and parallel to polarized light from light source.

However, Zinser et al teach in fig 1 device 22 is polarization-sensitive such that only reflected light which is linearly polarized in a direction which is rotated by 90 degree. The polarization direction of the reflected light is rotated by 90 degree compared to the polarization direction of the laser source [see column 7 lines 52-65]. The polarization direction can be parallel and orthogonal since it can rotate 90 degree; for example at 90 degree the two directions are parallel and at 45 they are orthogonal (emphasis added).

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Shih with Zinser by having polarization direction orthogonal and parallel to polarized light from filter and light source; in order to accurately illuminate desired regions of interest.

3. Claims 13 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih (US Pat: 6,061,176) in view of Godik (US Pat: 5,699,797) and further in view

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of Nilsson (US Pat: 5,361,769) and Zinser et al (US Pat: 5,620,000) as applied to claim 12 above and further in view of Crutchfield et al (Pub. No.: US 2002/0091320).

Regarding claims 20-22, Shih doesn't teach mobile communication terminal capable of transmitting data matrix over a telecommunication network.

With regards to telecommunication network; Applicant discloses network such as a mobile network or a public fixed network, the Internet. The system can be integrated with a mobile communication terminal as details of a mobile telephone, or form separate units combined with local communication links [see 0019, specification].

However, Zinser et al teach computer 32 which is well known in the art to be connected to internet which is capable of transmitting output data matrix and links are normally cable or wireless (emphasis added). It is well known these days mobile telephones can connect to the internet and can communicate with a computer through the internet (emphasis added).

Nevertheless, Crutchfield et al teach their invention includes a system having the capability for a variety of communication mechanisms such as access to the Internet [see 0110]. Crutchfield et al further disclose transmitting the data to a computer in a remote location [see 0111].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Shih with Zinser et al and Crutchfield et al by using internet to transmit diagnostic data to a remote location; for the purpose of providing accurate prediction of the future occurrence of vascular disease [see 0110, Crutchfield et al].

Regarding claim 13, Shih doesn't teach image of vasodilatation or constriction colored or shaded in accordance with a scale

With regards to vasodilation and vasoconstriction; Applicant discloses administer vasoactive agents such as acetylcholine, sodium nitroprusside, determine the effect on microcirculation and output data matrix as an image of vasodilation and vasoconstriction [see 0011, specification].

However, Shih discloses display different conditions in the microcirculation of human body, such as dilatation, blood cell aggregation, and blood velocity in capillaries; so that microcirculation at multiple areas in human body can be continuously observed and quantitatively measured [see column 3 lines 34-45].

Nonetheless, Crutchfield et al teach administering vasoactive drug and used an assessment method such as calculating a pulsatile index to determine the effect of the drug and condition of a blood vessel [see 0056-0060, 0080, 0192]. Crutchfield et al also teach the presence of vasodilators and/or vasoconstrictors in a patient indicating dilation or constriction of an artery [see 0218]. Crutchfield et al further teach processing method that can use color coded to display blood flow characteristics such the presence of a blockage or restriction, or the passage of an embolus through the artery [see 0184].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Shih with Crutchfield et al by using color coding to display an image of dilation or constriction after administering vasoactive drug as

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taught by Crutchfield et al and according to a scale; for the purpose of diagnosing blood flow with accuracy and with an increased visualization.

4. Claims 16-18 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shih (US Pat: 6,061,176) in view of Godik (US Pat: 5,699,797) and further in view of Nilsson (US Pat: 5,361,769) and Zinser et al (US Pat: 5,620,000) as applied to claim 12 above and further in view of Nakakuki (Pub. No.: US 2004/0208393).

Regarding claim 17, Shih and Zinser et al don't mention matrix employing difference of values of matrix representing red and green divided by the sum of corresponding values of data matrix representing red and green.

However, Nakakuki teaches the image data corresponding to red, green and blue may be divided into a group of pixels in a matrix [see 0024] and the luminance for each pixel may be represented as 8-bit data. In this case, the luminance of each pixel in the image data is converted into a numerical value on a scale of 0-255 [see 0024].

Therefore, one with ordinary skill in the art at the time the invention was made would have motivated to combine Shih and Zinser et al with Nakakuki by using the above teaching of Nakakuki; for the purpose of increasing visualization.

Regarding claims 16, 18 and 36-38, all other limitations are taught as set forth by the above teaching.

Shih and Zinser et al don't teach normalization of values of data matrixes and compensating for tissue color.

With regards to normalization of data matrixes and compensating for tissue color; Applicant discloses normalization of the color data matrixes by dividing each color value in the original data matrixes by the average value for the same color representation in the reference area, thereby compensating for fluctuations in flash or continuous light intensity [see 0032, specification].

However, Nakakuki teaches the image data corresponding to red, green and blue may be divided into a group of pixels in a matrix [see 0024].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Shih and Zinser et al with Nakakuki by dividing each color value by the average value of the same color representation and any combination thereof to compensate for tissue colors; for accuracy and reliability purposes.

5. Claim 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Shih (US Pat: 6,061,176) in view of Godik (US Pat: 5,699,797) and further in view of Nilsson (US Pat: 5,361,769) and Zinser et al (US Pat: 5,620,000) as applied to claim 12 above and further in view of Takahashi et al (US Pat: 4,366,529).

Regarding claim 19, Shih doesn't mention flexible optical fibers capable of directing light to a body cavity.

However, Takahashi et al teach an illuminating light beam is directed to a portion of the body cavity to be examined through a bundle of optical fibers incorporated in the flexible pipe [see column 1 lines 17-27].

Therefore, one with ordinary skill in the art at the time the invention was made would have been motivated to combine Shih with Takahashi et al by using flexible fiber optics to direct light into a body cavity; in order to minimize thermal damage to the body cavity which may be caused by the illumination.

Response to Arguments

6. Applicant's arguments with respect to claims 12-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOEL F. BRUTUS whose telephone number is (571)270-3847. The examiner can normally be reached on Mon-Fri 7:30 AM to 5:00 PM (Off alternative Fri).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (571)272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. F. B./

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Examiner, Art Unit 3777

/Tse Chen/

Supervisory Patent Examiner, Art Unit 3777